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SCIENTIFIC MANAGEMENT AND THE WAGE-EARNER

Efficiency programs are attracting much attention in this country, at the present time, because nearly all of the great expanse of land found within the borders of the United States has been taken up and the vast natural resources of the nation have been tapped. We are entering a period of diminishing returns; and a period in which increasing attention will be directed toward small economies that were not considered worthy of notice a generation ago. "The cream has been skimmed off the pan of our natural resources." Also, factory legislation, laws as to hours of labor, and the activity of labor organizations are tending to raise the level of wages and to increase the expenses of operating a business. As a consequence, employers are being stimulated to adopt more efficient methods.

Many indications point to the conclusion that modern industrial nations are passing over the threshold of a new era in industrial and social progress. We are about to enter upon a period marked by the rapid increase in the use of machinery and of carefully planned methods of doing work. Witness, for example, the glass-bottle blowing machine, the giant mail-order house with its systematized large-scale distribution of goods, and the farmer's use of engines drawing gang-plows. The term "industrial revolution" has heretofore been applied to the rapid adoption of new tools and machines.

"Social invention" is to be typical of the epoch just ahead. And what may be tabulated under the head of social invention, efficiency engineering, or scientific management? Efficient combinations of labor-saving machines, accurate information as to the time and energy required to do specific jobs, motion studies of different craftsmen, and psychological studies of the kinds of incentives which most effectively stimulate workers to do their work efficiently—these are some of the important planks in the efficiency program.

Scientific management or efficiency engineering is concerned

with two somewhat interrelated matters. The first is efficient systematization of the work in a given factory from the engineering or the mechanical point of view—the routing of the work, proper cutting speeds, the care of tools and machines, and the like. The second factor is psychological in its nature; it relates to the effective methods of “energizing” the workers by providing potent incentives and by stimulating interest in the work. The first is the more simple of the two problems but it cannot be carried out successfully without solving the psychological problem. Since technical improvements in machine-shop methods increase the per-capita output of the wage-earners, these scientific methods will doubtless be introduced, as were machines, in spite of opposition. Efficient methods of doing work will sooner or later displace less efficient methods just as, for example, the steamboat has displaced the sailboat, the automobile is displacing the horse upon the streets of our cities, and the giant drop-hammer has displaced the village blacksmith. The transformation may be retarded; but the constant pressure of economic forces will finally break down all opposition.

But the second portion of the program of the efficiency engineer cannot be forced through. It cannot be secured by coercion; it can be effectively carried out only when the wage-earners harmoniously co-operate with the managers in working out the proposed plan. The fundamental problem of efficiency engineering centers around the treatment of the wage-earners. It is more a problem concerned with the relations existing between the employer and his employees than it is a problem of bookkeeping or of the care of machines or of the selection of tools. The pioneer and leading exponent of efficiency engineering, Mr. F. W. Taylor, writes: “This close, intimate, personal co-operation between the management and the men is of the essence of modern scientific or task management.” And Harrington Emerson asserts that to “establish rational work standards for men requires, indeed, motion and time studies of all operations, but it requires in addition all the skill of the planning manager, all the skill of the physician, of the humanitarian, of the physiologist; it requires infinite knowledge directed, guided, and restrained by hope, faith, and compassion.”

In theory, according to its advocates, scientific management stands for increased productive capacity without increased effort; it aims to do away with lost motion and useless movements. It means maximum results with a minimum of effort; it does not mean "frenzied production." Now, these objects are certainly worthy of approval; and, consequently, opposition to efficiency engineering must arise because of the methods employed in carrying out the policy. Our attention evidently must be directed toward this pertinent inquiry: How, then, can this "close, intimate, personal co-operation" of which Mr. Taylor speaks, be secured?

It is perhaps worth while at the outset to call attention to the obvious fact that the man who is "working for himself" does not object to methods or systems which lighten his work. The farmer is glad to obtain a tool which will increase his productivity. Even the conservative wife of the farmer is not adverse to the installation of a new or better pump, a cream-separator, or some scheme which will save steps. Why then, it may be asked, does the wage-earner so frequently resist the introduction of new machinery or of new and scientific methods of performing work? The farmer and the farmer's wife do not fear that the new machines or methods will cause them to lose their positions, or that they will be called upon to do much more work for little more pay. They believe, on the contrary, that their income will be increased and the length of their working-day reduced. In short, they are confident that the results of their efforts will be multiplied. On the other hand, the wage-earner feels instinctively, too often as the consequence of past experience, that the system of scientific management is some more or less subtle scheme to advance the interests of his employer at the expense of the workers individually or as a class. How can the viewpoint of the worker be modified until it coincides in this particular with that of the farmer or with that of the man who is "working for himself"? This points to another fundamental problem for the efficiency engineer to solve.

The wage-earner is today insistently demanding that a portion of his share in the advantages accruing from the introduction of improved machinery and of scientific management be given to him in the form of a shorter working-day. His conception of a desirable

form of society in the twentieth century is not one in which a certain number of individuals work at high speed during a long working-day but one in which all work during a short working-day. There are, obviously, at least two alternative methods which may be pursued in producing a given quota of economic goods and services: a small number of men may be employed for a long working-day or a larger number for a shorter working-day. From the standpoint of the wage-earner observing a large and apparently growing army of unemployed, the second alternative is by no means repulsive. His ideal is not necessarily maximum productivity per worker per day; but a condition in which work and recreation are blended for each and every individual. And, if economics is "the reasoned activity of a people tending toward the satisfaction of its needs," shall the economist confidently assert that the wage-earner's ideal is one worthy only of contemptuous rejection?

If scientific management has great possibilities, the effect of its introduction may not be unlike that caused by the displacement of the hand tool by the machine. Not only may increased production be anticipated, but also the displacement of workers, temporary unemployment for many, and a multitude of industrial evils which accompany every important readjustment in the sphere of industry. The introduction of scientific management bids fair to cause "another intensive, resistless reordering of industrial life." And the wage-earner, with his skill as his sole capital, with only a small savings account or none, and with a family to provide for, is justified in manifesting alarm. A "resistless reordering of industrial life" usually means, for many wage-earners, unemployment and uncertainty. John Stuart Mill asserted that "hitherto it is questionable if all the mechanical inventions yet made have lightened the day's toil of any human being." Will scientific management do so?

Before passing to a consideration of the conditions which are requisite for the successful outcome of scientific management, it seems appropriate to notice some of the points made by Mr. F. W. Taylor in his recent book, *The Principles of Scientific Management*. These points have a direct bearing upon the later discussion of the topic under consideration.

Mr. Taylor declares that under an adequate system of scientific management, "each man should daily be taught by, and receive the most friendly help from, those who are over him, instead of being, at the one extreme, driven or coerced by his bosses, and at the other left to his own unaided devices." In this manner, it is urged, "systematic soldiering" on the one hand and injurious speeding-up on the other hand will be avoided. But is it reasonable to expect that the workers will willingly and contentedly leave the determination of the definition of systematic soldiering and injurious speeding-up to the inevitably prejudiced judgment of their employers?

The model workman, from the standpoint of the typical efficiency engineer, is the vigorous man who freely expends all of his surplus energy during working-hours and who utilizes his non-working-hours only for recuperation and preparation for another day's work. It is not the purpose of efficiency engineering to allow the worker to depart from the door of the factory at night with more than a minimum of surplus energy for recreation, for family life, for civic duties, or for trade-union activities. In short, I find little in the actual program of efficiency engineering which indicates that the wage-earner is to be given opportunity for individual development—and I have not overlooked the various paternalistic endeavors classified as welfare work. A human machine rather than a man is the "model workman." I also find little, or more accurately nothing, in Mr. Taylor's book which indicates that he appreciates or sympathizes with the viewpoint of the wage-earner.

Mr. Taylor informs us that a long series of experiments has shown that an increase in wages up to 60 per cent beyond the wages usually paid has a good effect upon the men. But, "on the other hand, when they receive much more than a 60 per cent increase in wages, many of them will work irregularly and tend to become more or less shiftless, extravagant, and dissipated. Our experiments showed, in other words, that it does not do for most men to get rich too fast." But what of the efficiency of the corporation which receives large increases in its rate of profits? How do such increases affect the alertness of the managers, the adoption of improved

methods, machines, and safety appliances? Can the workers or the consumers afford to allow an employing corporation to increase its rate of profits? If so, how rapidly and how much? This is an unworked field of efficiency engineering. And our efficiency engineers are not enthusiastically interested in investigations of this sort.

"Soldiering" on the part of wage-earners in the United States is alleged to be a menace to the prosperity of every establishment and of every wage-earner in the nation. The causes of soldiering, according to Mr. Taylor, are three in number; but these are readily reducible to two. These two causes may be stated as follows: (a) the general acceptance of the lump-of-work doctrine; (b) the lack of scientific management. I have elsewhere¹ shown that the lump-of-work argument cannot be so easily laughed out of court as some economists and employers would have us believe. The workingman is interested in tomorrow's job and wages rather than in some indefinite benefit to society next decade.

The knowledge that a certain policy, if pursued by all for a period of years, will inevitably bring about reductions in the wage scale does not appeal to the average wage-earner with a family to feed, clothe, and shelter, in the direct and forceful manner that the immediate probability of slack work does. He sees that by "nursing" a particular job he may work longer or another fellow-workman may be employed. This is something tangible, the other is a remote and uncertain possibility. Immediate work for John overshadows the vision of a chance of future employment for Tom, Dick, and Harry, and other unnamed and unknown individuals.

Mr. Taylor directs attention to the shoe industry. The introduction of machinery into this industry has undoubtedly cheapened the price of shoes to the consumer; and the workers can, as a consequence, afford to buy more and better shoes. And it may also be true "that there are relatively more men working in the shoe industry than ever before." But it is also a fact that many workers were adversely affected by the introduction of shoe machinery. That great and spectacular outburst of unionism—the Knights of St. Crispin—was not the fantastic result of purely imaginary dangers. Many men with wives and children to feed, clothe, and house saw their trade, that is, their means of earning a

¹ *The History and Problems of Organized Labor*, pp. 132-34.

decent livelihood, being ruined; they saw—and their vision was not defective—the menace, at that time and place, of cheap labor. Their problem was individual and immediate, not social and a matter of future welfare.

The non-social lump-of-work argument is closely paralleled by what may well be called a lump-of-capital argument. Many a corporation composed of individuals who are not in business for their health has obtained a patent upon some new appliance which would cheapen the cost of production but necessitate the scrapping of much valuable equipment; and, consequently, with the aid of our antiquated patent laws such corporations have quietly shelved the patents. The attitude of the capitalist in such a case is not very dissimilar to that of the workingman who opposes the introduction of machinery or of new processes which threaten his trade or his lump-of-labor. In addition to the prevention of soldiering on the part of workmen one of the problems of a well-rounded program of efficiency engineering would be to prevent the shelving of new appliances and machines, and, perhaps, to call for a modification of patent laws. But so far as my knowledge goes, our efficiency engineers have not paid much attention to this important matter.

With these illustrations before us, you are asked to direct your attention to the requisites, in the judgment of the writer, for a successful form of efficiency engineering or of scientific management.

All careful and disinterested students of efficiency engineering will doubtless admit that such systems are advocated by the employer, that the employer instituting them expects to direct their operation, and that the systems are adopted primarily for the benefit of the employer. The problems connected with the various systems are viewed from the standpoint of the employer and capitalist. Benefit to the wage-earner is perhaps considered to be an incidental advantage; but it is a secondary matter. The bright and shining goal—the attractive lure—is lowered costs and increased profits, rather than better workmen and citizens, or more leisure and culture and enjoyment for the toiling mass and their families. Is it reasonable to expect that the wage-earners,

organized or unorganized, will grow enthusiastic over a lop-sided system of scientific management? If, as Mr. Taylor declares, "close, intimate, personal co-operation" is required to "energize" a plant, efficiency engineering cannot reach a high degree of success while the workers distrust the motives of the employer, or as long as the workers in the plant are convinced that the employer is trying to get more work out of them without proportionally increasing their pay.

The average American citizen looks askance upon an arbitrary government which is in no way under the control of the mass of governed. The despot, whether enlightened and benevolent or not, would be regarded with suspicion and would not be tolerated. Men have repeatedly and vigorously objected to arbitrary action on the part of government. And for centuries the western world has been moving toward democracy. The Louis XIV view of government is obsolete, but absolutism in industry is still characteristic of the business world. Will not, therefore, the average wage-earner, granted political privileges but shut out of the councils of industry, distrust the management of the business in which he earns his daily bread. He will certainly see in the plans of the employer schemes for quietly and effectively squeezing the laboring man. The workers in our shops, factories, and mines can no more be expected to look with favor upon arbitrary changes concerning which they have not been consulted, than can the average citizen of today be expected smilingly to abide by the rulings of an arbitrary monarch.

The day of the individual entrepreneur is of the past, not of the present nor of the future. We may regret his going; we may vociferously assert that he was superior to the giant corporation with its collection of mutually independent units, and we may argue that the rivalry between entrepreneur and entrepreneur is essential to business progress and industrial efficiency; but the corporation is here, and here to stay. Likewise, the day of individual bargaining with the isolated worker is passing. Employers may strive to delay its going; but in vain will be the effort. Professor Commons has pointed out that unorganized as well as organized workers are willing to strike for the right to bargain collectively. "It is their desperate recognition that the day of individual bargains

is gone for them.” It is safe to assert that efficiency engineering will not be successfully introduced and maintained by union-smashing corporations demanding individual bargaining with workers, because “close, intimate, personal co-operation between the management and the men” obviously is impossible under such conditions.

Organized labor is definitely committed to the method of collective bargaining; and both organized and unorganized wage-earners recognize that, except in a few highly skilled trades and in the case of farm laborers, the individual bargain leads toward a sweating system. The employer who demands the continued use of the individual bargain, whether the demand is made in the name of liberty and the freedom of contract or in the name of efficiency, becomes an object of suspicion. Individual bargaining is productive of distrust rather than of harmonious co-operation. And consequently efficiency engineering can only hope to succeed, in the long run, in energizing workers by utilizing the collective bargain. And accepting the collective bargain means the partial admission of the representatives of the workers into the councils of the employers. It is a tentative step away from autocracy in business; it is a step toward putting industry upon a peace instead of a war footing. Collective bargaining and the admission of the workers into the councils of the management are essentials of close co-operation between the management and the employees. But the leaders in the movement for efficiency engineering have not, as yet, given this fundamental fact definite recognition.

Successful scientific management—management which possesses the qualities demanded by its advocates—must necessarily cast aside the old incentives such as coercion, and the constant nagging and prodding by the foreman. Furthermore, it must be so directed that the workers will be convinced that it is to their interests to accept the planning-room’s methods and program, and to follow the system outlined by the experts in charge of the work. But, without organization and the collective bargain, have the workers any reason to believe that the program of the efficiency engineer will benefit them? If the history of the introduction of machinery, or of the course of events in the steel industry since unionism was

driven from the steel mills offers any useful lessons, the obvious conclusion, in the judgment of the writer, is that the workers must unite upon both the industrial and the political field in order to derive any considerable share of the advantage of efficiency engineering. Without united and aggressive action, it may be anticipated that the workers will be shorn of the major portion of the direct benefits which may result. Mutual respect and co-operation between employers and employees are the fruits of equality in the strength and coherence of their respective organizations; and, indeed, only under such conditions can scientific management achieve its maximum of efficiency. Further, it may be quite confidently asserted, that if under our present industrial order this kind of scientific management or of efficiency engineering cannot thrive, then is that order doomed to be displaced by socialism or some other form of industrial democracy.

The growth of industrial unionism with its emphasis upon direct action, as illustrated in the recent English strikes and the Lawrence strike, indicates that a new era in unionism is beginning. Bitter opposition to organized labor and contemptuous disregard of the demands of employees are strengthening the spirit of solidarity in the ranks of the working class. If it be desirable that a class-conscious and united army of wage-earners be developed, then the bitterest and most uncompromising opponents of organized labor are its friends in disguise; and the union-recognizing employer its dangerous antagonist. But if it be desirable to prevent such a consummation, the wise and conservative entrepreneur of today will recognize organized labor and accept the collective bargain.

In fixing upon the remuneration to be given to the wage-earner in a factory where scientific management is utilized, two points must be determined: the day wage and the amount or rate of the premium or bonus. In either case it is possible to utilize the collective bargain. The premium rate as well as the day wage can undoubtedly be fixed by means of the collective bargain. Scientific management can therefore utilize the collective bargain; it is not restricted to the individual bargain. And it is not clear that the wage-earner need oppose. Although under the premium plan, all workers in a given class would not receive the same weekly wage,

yet the premium rate could be adjusted by agreement between the employer and the officers of the union. And the rate also could be so adjusted as to militate against over-driving. The spokesmen of organized labor inform the general public that the union demands a minimum wage, not a uniform wage. But a reasonable premium plan would offer a minimum wage with an opportunity to receive a bonus for efficiency. This would not necessarily militate against organized labor unless a flat rate of wages within a given class of workers is essential to the maintenance of union solidarity.

In conclusion, it may be pointed out that the success of collective bargaining which has been asserted to be an essential element in successful efficiency engineering in turn depends upon the solution of the basic problem: What is a fair wage? Or, more, specifically the question may be formulated in the following manner: What is a fair wage in an epoch when competition is being displaced as an effective force in the industrial world? Or, one further step may be taken: Is there a concept of a fair wage which can be made acceptable to both employer and employees? Concretely and specifically, the question may be stated after this fashion: Can a scientific basis be found for the determination of a satisfactory time base and for a satisfactory premium rate for the various progressive wage systems which are being introduced by efficiency engineers? The familiar theories of wages such as the wage-fund theory, the residual theory, and the marginal-productivity theory are all grounded upon the fundamental postulate of free competition. But today monopoly, special privileges, and economic friction play such important rôles in the economic sphere that none of these theories throws much light upon the actual wage question. Indeed, no inconsiderable portion of the recent theorizing as to the rights of labor and of capital is futile because it proceeds on the theory that free competition exists. To work out the hypothetical course of a projectile moving in a vacuum is important; but in order to determine its actual trajectory such studies must be supplemented. In like manner, a theory of wages applicable in a hypothetical state of free competition is desirable; but it also should be supplemented by a thorough study of the effect of economic friction and monopoly.

And, lastly, it may not be irrelevant to inquire: Can scientific management reach a high level of efficiency while approximately one-half of the adult wage-earners of the nation are receiving not more than \$500 per year? But students of workingmen's budgets seem to agree that in order to support a normal family in a decent manner an income of \$750 to \$900 per year is required. Does not the efficient working-out of a plan of scientific management require the efficiency engineer to go outside the shop in which the workers are employed? Does it not require a study of the conditions surrounding the home life and the recreations of the wage-earner, such as food, housing, amusements, and the like? In building the Panama Canal, it was found necessary to devote much attention to the sanitary conditions within the Canal Zone. This work was carried out as an essential part of the work of building the canal; it was an integral part of scientific management and of good business policy as applied to that great undertaking. Surely the same principles apply to the management of any large business within the borders of the nation.

In brief, these are the conclusions reached: (1) Up to the present, efficiency engineering has been a one-sided matter. (2) If any high degree of success is to be attained the co-operation of the men with the management must be secured. (3) Such co-operation can be secured only by utilizing the collective bargain and by admitting in some measure the representatives of the workers into the councils of the management. (4) And, still further, the success of collective bargaining depends, in the long run, upon finding some mutually acceptable basis for a fair wage.

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